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TO: USPTO 3616 ART UNIT

FIRM:

FAX NO.: 571-273-8300

FROM: L.C. Begin & Associates, PLLC

DATE: 1/9/06

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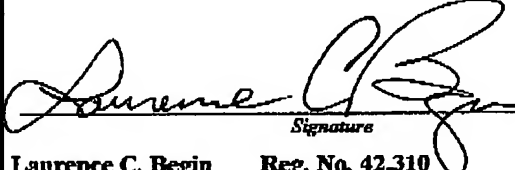

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PAGE 2/37 * RCVD AT 1/9/2006 10:07:44 PM [Eastern Standard Time] * SVR:USPTO-EFXRF-6/30 * DNIS:2738300 * CSID:12488877664 * DURATION (mm-ss):08-50

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LC Begin & Associates

COMBINED TRANSMITTAL OF APPEAL BRIEF TO THE BOARD OF PATENT APPEALS AND INTERFERENCES & PETITION FOR EXTENSION OF TIME UNDER 37 C.F.R. 1.136(a) (Large Entity)					Docket No. 5702-00068	
In Re Application Of: Takashi Furasawa et al						
Application No. 10/762,709	Filing Date 1/22/05	Examiner David R. Dunn	Customer No. 46510	Group Art Unit 3616	Confirmation No. 5208	
Invention: Airbag Release Aid						
<p style="text-align: center;"><u>TO THE COMMISSIONER FOR PATENTS:</u></p> <p>This combined Transmittal of Appeal Brief to the Board of Patent Appeals and Interferences and petition for extension of time under 37 CFR 1.136(a) is respectfully submitted by the undersigned:</p> <div style="display: flex; justify-content: space-between; align-items: flex-end; margin-top: 20px;"> <div style="width: 40%;">  <p style="text-align: center; font-size: small;">Signature</p> <p>Laurence C. Begin Reg. No. 42,310 L.C. begin & Associates, PLLC 510 Highland Avenue PMB 403 Milford, Michigan 48381</p> </div> <div style="width: 50%; text-align: right;"> Dated: January 9, 2006 </div> </div>						
<div style="display: flex; justify-content: space-between;"> <div style="width: 48%;"> <p style="text-align: center;">Certificate of Transmission by Facsimile</p> <div style="border: 1px solid black; padding: 5px;"> <p>I certify that this document and authorization to charge deposit account is being facsimile transmitted to the United States Patent and Trademark Office (Fax no. 571-273-8300) on</p> <p><u>1/9/06</u> (Date)</p>  <p style="text-align: center; font-size: small;">Signature</p> <p style="text-align: center;">Laurence C. Begin</p> <p style="text-align: center; font-size: small;">Typed or Printed Name of Person Signing Certificate</p> </div> <p style="font-size: small; margin-top: 5px;">*This certificate may only be used if paying by deposit account CREDIT CARD</p> </div> <div style="width: 48%;"> <p style="text-align: center;">Certificate of Mailing</p> <div style="border: 1px solid black; padding: 5px;"> <p>I hereby certify that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to "Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450" [37 CFR 1.8(a)] on</p> <p>_____ (Date)</p> <p style="text-align: center; font-size: small;">Signature of Person Mailing Correspondence</p> <p style="text-align: center; font-size: small;">Typed or Printed Name of Person Mailing Correspondence</p> </div> </div> </div>						
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Group Art Unit 3616
Examiner David R. Dunn

TAKASI FURUSAWA, et al.

APPEAL BRIEF

Serial No. 10/762,709

Filed January 22, 2004

For: AIRBAG RELEASE AID/

January 9, 2006

Box AF
Assistant Commissioner of Patents
Washington, D.C. 20231

Sir:

This is an appeal from the final rejection of claims 1 and 4-6 set forth in the office action mailed April 7, 2005. Concurrently herewith, Applicants petition for a three-month extension of time for the period of response and include the appropriate fee.

(1) Real Party of Interest:

The real party of interest in this appeal is Automotive Systems Laboratory, Inc., a Michigan corporation, the owner of the subject application by assignment.

(2) Related Appeals and Interferences:

There are presently no other appeals and/or interferences known to appellant, appellant's legal representative, or assignee which will directly affect or be directly affected by the Board's decision in the pending appeal.

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Appeal Brief

Atty. Dkt. No. 5702-00068

(3) Status of Claims:

Claims 1 and 4-6 are pending and stand finally rejected in an Office Action dated April 7, 2006 (Paper #20050331).

(4) Status of Amendments:

No Amendment was filed After the Final Rejection.

(5) Summary of the Invention:

In accordance with the present invention, a gas generator or airbag inflator contains a plurality of beads containing gel and water disposed around a propellant chamber of a conventional gas inflator. The plurality of beads operates, in conjunction with a primary expanded metal filter, as a secondary filter and heat sink, and, as an airbag release agent. By cooling the propellant combustion gases in stages and providing sufficient residence time within the generator, the CO and NO equilibrium conditions are shifted to relatively low, acceptable, CO and NO concentrations. At the same time, humidification or introduction of water vapor (released from the gelatin/water matrix) to substantially filtered combustion products reduces the pressure required to release and inflate an airbag in fluid communication with the inflator.

As claimed in claim 1, the present invention includes a method of improving inflation of an airbag by first substantially filtering combustion gases (to remove the solids) and thereby form filtered combustion products. Next, the filtered combustion products are humidified and then routed into an airbag. Humidification after the filtration step ensures that the filter is not blocked by dampened slag or solids thereby interrupting the gas flow into the bag. Furthermore, staged cooling of the gases prior to humidification optimizes the oxidation of gases not desired in the effluent.

Stated another way, and as claimed in claim 6, the present invention includes adding water to filtered combustion products and routing the filtered and then humidified combustion products into an airbag to improve the inflation of the airbag with a reduced amount of pressure.

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Appeal Brief

Atty. Dkt. No. 5702-00068

(6) Issues:

Did the Examiner err in finally rejecting claims 1 and 4-6 as being unpatentable over Lohr (U.S. Patent No. 3,711,115) in view of Kirchoff et al. (U.S. Patent No. 3,972,545) under 35 U.S.C. §103(a)?

(7) Grouping of Claims:

Claims 1 and 4-6 stand together as being rejected for the same reasons.

(8) Argument:

The basic reference applied against claims 1 and 4-6, namely U.S. Patent No. 3,711,115 to Lohr does not respond to the positive limitations of claims 1 and 6, and all claims dependent thereon. Lohr does describe an inflator for vehicle gas bags, but filtration is not considered. In fact the design of Lohr, as described below inherently teaches away from the filters of Kirchoff.

Applicant respectfully submits that the rejection of claims 1 and 4-6 under 35 U.S.C. 103(a) should be withdrawn because a prima facie case for the obviousness of claim 1 has not been established. Specifically, there is no suggestion or motivation, either in the references or in the knowledge generally available to one of ordinary skill in the art, to combine the teachings of Lohr '115 and Kirchoff et al. '545 to provide method steps of "humidifying the filtered combustion products to form humidified filtered combustion products" and "routing the humidified filtered combustion products into the airbag", as recited in claim 1.

The cited references do not, either alone or in combination, show or suggest any relationship between the addition of water to the combustion products after combustion, and after the filtration of the combustion products. In the cited references, both the use of filters (in Kirchoff et al. '545) and the addition of water (in Lohr '115) are directed to cooling the gases prior to injection of the gases into an airbag. In Lohr '115, water is added to combustion gases for cooling the gases prior to injection of the gases into an airbag. No

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Appeal Brief

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filtration of the gases is disclosed, either prior to or after addition of the water to the gases. Therefore, there is no teaching or suggestion in Lohr '115 regarding filtration of combustion products either before or after humidification of the combustion products. Kirchoff et al. '545 is silent as to the addition of water to the combustion products, either before or after filtration. Therefore, there is no teaching or suggestion in Kirchoff et al. '545 regarding filtration of combustion products either before or after humidification of the combustion products. Thus, neither of the cited references, alone or in combination, show nor suggest any relationship between the addition of water to the combustion products after combustion, and the filtration of the combustion products.

Also as stated above, Kirchoff et al. '545 is silent as to the addition of water to combustion products either before or after filtration. However, Lohr '115 teaches the addition of water to combustions gases without prior filtration of the gases. Lohr '115 also teaches the routing of unfiltered combustion products into the airbag. Therefore, Lohr '115 teaches against filtration of combustion products prior to the addition of water, and against the routing of humidified filtered combustion products into the airbag, as disclosed in the present application.

It should further be noted that the gas generator of Kirchoff employs a filter 22 prior to treatment of the gases neutralizing material 26. However, the same material is also used to cool the gases thereafter. Note that in column 3, lines 9-34, Kirchoff indicates that the same material of filter 22 is used after treatment of the gases as the gases pass through section 30 for cooling. Kirchoff does not suggest an alternative to cooling the gases, as they are essentially further filtered/cooled after treatment within the pH neutralizing material, In contravention of the present invention. Without any suggestion of the generic nature of treatment by Lohr or Kirchoff, the examiner also equates the treatment of the gases by pH in Kirchoff with the humidification of the gases in the present invention. There is simply no substantive evidence in the references to support this assertion by the examiner.

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Finally, from a pragmatic standpoint, the filter of Kirchoff simply would not be added to the inflator of Lohr, for the engineering considerations of Lohr would prohibit this. Kirchoff describes a filter 22 that provides filtration of gas *flowing longitudinally* from the combustion chamber (s). The filter 22 of Kirchoff simply would not be employed within the inflator of Lohr given that combustion gases (for inflation of an airbag) produced therein initially *flow radially inward* into passage 26, not in an initial longitudinal path as provided in Kirchoff. The combustion gases of Lohr then flow longitudinally through passage 26 as described at column 9, lines 43-58 for example. Accordingly, the filter 22 of Kirchoff would provide very little filtration of the combustion gases (perhaps filtration of gases ultimately flowing into chamber 40), that are used to inflate the airbag. If the filter 22 of Kirchoff was employed, it will be appreciated that "hot gases" would be filtered, but they would also be relatively cooled as they pass through the filter. This contravenes the theory of operation provided by Lohr.

In addition to the desorbing and dehydrating effect of reduced pressures, a limited number of holes 42 disposed in the fireproof wall 44, separating the second combustion state 28, or downstream stage in the case of a gas generator having more than two stages, and the water removal means 38, provide the means for a small percentage of the gas generated in compartment 21 to flow into the water removal means compartment 40. This gas flow is indicated by the arrows 37. The gas 37 heats the particles 41. Of course, the gas flowing through the nozzle 46 also indirectly heat the particles 41. The effect of temperature increase on desorption and dehydration is the same as that of reduced pressure. Thus, the combined effect of increased temperature and decreased pressure is the liberation of most of the water held by the water removal means 38. See Column 9, line 59 through Column 10, line 7 and Figure 1 of Lohr.

Accordingly, the addition of a filter 22 as described by Kirchoff within the generator 2 of Lohr, would inhibit water vapor 50 production by reducing the temperature of the gases flowing into chamber 40. Accordingly, less water vapor would be produced for cooling of gases flowing through conduit 26 and for inflation of an airbag associated therewith.

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It will also be appreciated that longitudinal traverse of the gases flowing through conduit 26 also contributes to water vapor production 50 within chamber 40. As the gases 36 are throttled at a narrowing portion in conduit 26 that is radially inward of chamber 40, the water stored within material 41 is liberated due to a pressure drop created at the venturi defined by the narrowing portion of conduit 26. The water vapor 50 is then combined with gases 36 flowing through conduit 26. Accordingly, any filtration of these gases flowing through conduit 26 would affect the pressure balance established through conduit 26 and also through the narrowing portion. The humidification of the gases 36 within conduit 26 would arguably be adversely affected *by a change in the pressure differential* that might be caused by filtering the gases prior to humidification in the narrowing portion of conduit 26.

Accordingly, from a design perspective, one of ordinary skill in the art would likely not include a filter 22 of Kirchoff within the generator 2 of Lohr, for it would contravene the purposes of the design of the generator 2. Stated another way, Lohr teaches away from the inclusion of the filter 22 because of the method of humidification described. A reference cannot suggest an invention and at the same time teach away from the invention. The examiner is advised that a prima facie case of obviousness cannot be supported when a reference teaches away from the present invention. Furthermore, for the reasons stated above, the design of the inflator of Lohr certainly would not result in the requisite suggestion or motivation to either directly or implicitly motivate one of ordinary skill in the art to include the filter 22 of Kirchoff in the generator 2 of Lohr.

For the reasons set forth above, there is no suggestion or motivation, either in the references or in the knowledge generally available to one of ordinary skill in the art, to combine the teachings of Lohr '115 and Kirchoff et al. '545 to provide method steps of "humidifying the filtered combustion products to form humidified filtered combustion products" and "routing the humidified filtered combustion products into the airbag", as recited in claim 1.

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The examiner asserts that the test for combining references is what the combination of disclosures taken as a whole would suggest to one of ordinary skill in the art, *In re McLaughlin*. Further, the examiner indicates that references are properly evaluated by what they suggest to one of ordinary skill in the art, not by their specific disclosures, *In Re Bozek*. Applicants respectfully disagree with the examiner's conclusion and would direct the examiner to more controlling cases.

First, "The level of skill in the art cannot be relied upon to provide the suggestion to combine references." *Al-Site Corp. v. VSI Int'l Inc.*, 174 F.3d 1308, 50 USPQ2d 1161 (Fed. Circ. 1999).

Next, "The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, *and not based on applicant's disclosure*". *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991). It would appear that the examiner, with the benefit of the present application, exercised impermissible hindsight reconstruction, particularly in view of the art cited. For the particular sequence of filtering and then humidifying the combustion gases is not disclosed in the art. Nor is there any suggestion in the references to modify the inflators of any of the respective designs to accommodate the problem of the present invention; that is to provide lubricity to the airbag without agglomerating the moisture within combustion solids within the filter. None of the references cited by the examiner enable the present sequence or approach, nor do they recognize the present problem. As such, they cannot when taken alone or in combination with each other of present or suggest a solution to the same when viewed by one of ordinary skill in the art. In essence, one of ordinary skill in the art would not consult these references for they focus on problems and solutions not particular to the present invention or problem.

Further, "A statement that modifications of the prior art to meet the claimed invention would have been "well within the ordinary skill of the art at the time the claimed invention was made" because the references relied upon teach that all aspects of the claimed invention were individually known in the art

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is not sufficient to establish a prima facie case of obviousness without some objective reason to combine the teachings of the references." Ex parte Levengood, 28 USPQ2d 1300 (Bd. Pat. App. & Inter. 1993). The examiner has not provided an objective reason to combine the references.

In sum, none of the references when taken alone or when taken together suggest or describe the present invention. Stated another way, for the reasons given, a prima facie case of obviousness cannot be supported by references that teach away from the present invention, nor can it be supported without the requisite showing of a motivation to combine the references.

The examiner is advised that if the proposed modification or combination of the prior art would change the principle of operation of the prior art invention being modified, then the teachings of the references are not sufficient to render the claims prima facie obvious. *In re Ratti*, 270 F.2d 810, 123 USPQ 349 (CCPA 1959). Filtering the effluent of Lohr prior to humidification would reduce the temperature of the gases, i.e. change the principle of operation, thereby inhibiting the ability of the gases to draw the moisture from the chamber 40 as they pass therethrough, and thereby inhibit the cooling of the gases.

The examiner is further advised that it is improper to combine references where the references teach away from their combination. *In re Grasselli*, 713 F.2d 731, 743, 218 USPQ 769, 779 (Fed. Cir. 1983).

(9) Conclusion:

For the above-stated reasons, the examiner has simply not met the burden of substantiating a prima facie case of obviousness relative to claims 1 and 4-6. Most importantly, the design of the inflator of Lohr teaches away from adding a filter that would function as a heat sink prior of the gases prior to the addition of the moisture. Accordingly, neither Lohr nor Kirchoff, either taken alone or together suggest a combination of the features of the respective inventions for the reasons stated. The requisite suggestion or motivation to

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combine the references is therefore lacking. Accordingly, reversal of the Examiner's rejection of claims 1 and 4-6 under 35 U.S.C. §103, and issuance of the present application is courteously solicited.

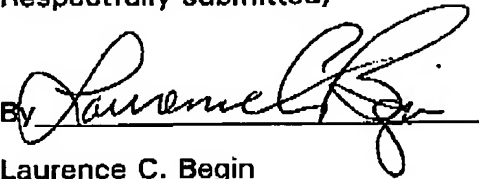
Applicants have calculated a fee of \$500.00 for the appeal brief and \$1020.00 for a three-month extension of time in connection with this brief. Our credit card authorization sheet is enclosed authorizing the amount of \$1,520.00. The Commissioner is hereby authorized to charge any additional fees incident to the filing of this communication to Deposit Account No. 50-3238. A duplicate copy of the front page of this document is enclosed. Applicants have faxed three copies of this appeal brief pursuant to 37 C.F.R. 1.192.

Date

1/9/06

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Respectfully submitted,

By 

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Atty. Dkt. No. 5702-00068

(10) Appendix – Claims 1 and 4-6:

1. (original and pending) A method of improving inflation of an airbag comprising the steps of:

igniting a gas generant composition within a gas generator to form combustion products;

at least substantially filtering the combustion products to form filtered combustion products;

humidifying the filtered combustion products to form humidified filtered combustion products; and

routing the humidified filtered combustion products into the airbag.

2. (cancelled) The method of claim 1 wherein said humidifying step comprises passing the filtered combustion products over a bed of hydrated gelatin to form humidified filtered combustion products.

3. (cancelled) The method of claim 1 wherein said humidifying step comprises routing the filtered combustion products into an airbag coated with gelatin to form humidified filtered combustion products.

4. (pending and previously presented) The method of claim 1 wherein said humidifying step further comprises combining the filtered combustion

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products with about 1.0 moles of water for each mole of gas generant combusted.

5. (pending and previously presented) The method of claim 1 wherein said humidifying step further comprises combining the filtered combustion products with about 1.0 moles of water for each mole of gas generant combusted.

6. (pending and previously presented) A method of reducing an amount of fluid pressure required to release and inflate an airbag comprising the steps of:

adding an amount of water to filtered combustion products
resulting from combustion of a gas generant composition,
thereby forming humidified filtered combustion products; and
routing the humidified combustion products into an opening
leading into the airbag, thereby reducing the resistance of the
airbag to inflation and correspondingly reducing the amount of
pressure required to inflate the airbag.

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Group Art Unit 3616
Examiner David R. Dunn

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APPEAL BRIEF

Serial No. 10/762,709

Filed January 22, 2004

For: AIRBAG RELEASE AID/

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(3) Status of Claims:

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(4) Status of Amendments:

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(5) Summary of the Invention:

In accordance with the present invention, a gas generator or airbag inflator contains a plurality of beads containing gel and water disposed around a propellant chamber of a conventional gas inflator. The plurality of beads operates, in conjunction with a primary expanded metal filter, as a secondary filter and heat sink, and, as an airbag release agent. By cooling the propellant combustion gases in stages and providing sufficient residence time within the generator, the CO and NO equilibrium conditions are shifted to relatively low, acceptable, CO and NO concentrations. At the same time, humidification or introduction of water vapor (released from the gelatin/water matrix) to substantially filtered combustion products reduces the pressure required to release and inflate an airbag in fluid communication with the inflator.

As claimed in claim 1, the present invention includes a method of improving inflation of an airbag by first substantially filtering combustion gases (to remove the solids) and thereby form filtered combustion products. Next, the filtered combustion products are humidified and then routed into an airbag. Humidification after the filtration step ensures that the filter is not blocked by dampened slag or solids thereby interrupting the gas flow into the bag. Furthermore, staged cooling of the gases prior to humidification optimizes the oxidation of gases not desired in the effluent.

Stated another way, and as claimed in claim 6, the present invention includes adding water to filtered combustion products and routing the filtered and then humidified combustion products into an airbag to improve the inflation of the airbag with a reduced amount of pressure.

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(6) Issues:

Did the Examiner err in finally rejecting claims 1 and 4-6 as being unpatentable over Lohr (U.S. Patent No. 3,711,115) in view of Kirchoff et al. (U.S. Patent No. 3,972,545) under 35 U.S.C. §103(a)?

(7) Grouping of Claims:

Claims 1 and 4-6 stand together as being rejected for the same reasons.

(8) Argument:

The basic reference applied against claims 1 and 4-6, namely U.S. Patent No. 3,711,115 to Lohr does not respond to the positive limitations of claims 1 and 6, and all claims dependent thereon. Lohr does describe an inflator for vehicle gas bags, but filtration is not considered. In fact the design of Lohr, as described below inherently teaches away from the filters of Kirchoff.

Applicant respectfully submits that the rejection of claims 1 and 4-6 under 35 U.S.C. 103(a) should be withdrawn because a prima facie case for the obviousness of claim 1 has not been established. Specifically, there is no suggestion or motivation, either in the references or in the knowledge generally available to one of ordinary skill in the art, to combine the teachings of Lohr '115 and Kirchoff et al. '545 to provide method steps of "humidifying the filtered combustion products to form humidified filtered combustion products" and "routing the humidified filtered combustion products into the airbag", as recited in claim 1.

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filtration of the gases is disclosed, either prior to or after addition of the water to the gases. Therefore, there is no teaching or suggestion in Lohr '115 regarding filtration of combustion products either before or after humidification of the combustion products. Kirchoff et al. '545 is silent as to the addition of water to the combustion products, either before or after filtration. Therefore, there is no teaching or suggestion in Kirchoff et al. '545 regarding filtration of combustion products either before or after humidification of the combustion products. Thus, neither of the cited references, alone or in combination, show nor suggest any relationship between the addition of water to the combustion products after combustion, and the filtration of the combustion products.

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It should further be noted that the gas generator of Kirchoff employs a filter 22 prior to treatment of the gases neutralizing material 26. However, the same material is also used to cool the gases thereafter. Note that in column 3, lines 9-34, Kirchoff indicates that the same material of filter 22 is used after treatment of the gases as the gases pass through section 30 for cooling. Kirchoff does not suggest an alternative to cooling the gases, as they are essentially further filtered/cooled after treatment within the pH neutralizing material, in contravention of the present invention. Without any suggestion of the generic nature of treatment by Lohr or Kirchoff, the examiner also equates the treatment of the gases by pH in Kirchoff with the humidification of the gases in the present invention. There is simply no substantive evidence in the references to support this assertion by the examiner.

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Finally, from a pragmatic standpoint, the filter of Kirchoff simply would not be added to the inflator of Lohr, for the engineering considerations of Lohr would prohibit this. Kirchoff describes a filter 22 that provides filtration of gas *flowing longitudinally* from the combustion chamber (s). The filter 22 of Kirchoff simply would not be employed within the inflator of Lohr given that combustion gases (for inflation of an airbag) produced therein initially *flow radially inward* into passage 26, not in an initial longitudinal path as provided in Kirchoff. The combustion gases of Lohr then flow longitudinally through passage 26 as described at column 9, lines 43-58 for example. Accordingly, the filter 22 of Kirchoff would provide very little filtration of the combustion gases (perhaps filtration of gases ultimately flowing into chamber 40), that are used to inflate the airbag. If the filter 22 of Kirchoff was employed, it will be appreciated that "hot gases" would be filtered, but they would also be relatively cooled as they pass through the filter. This contravenes the theory of operation provided by Lohr.

In addition to the desorbing and dehydrating effect of reduced pressures, a limited number of holes 42 disposed in the fireproof wall 44, separating the second combustion state 28, or downstream stage in the case of a gas generator having more than two stages, and the water removal means 38, provide the means for a small percentage of the gas generated in compartment 21 to flow into the water removal means compartment 40. This gas flow is indicated by the arrows 37. The gas 37 heats the particles 41. Of course, the gas flowing through the nozzle 46 also indirectly heat the particles 41. The effect of temperature increase on desorption and dehydration is the same as that of reduced pressure. Thus, the combined effect of increased temperature and decreased pressure is the liberation of most of the water held by the water removal means 38. See Column 9, line 59 through Column 10, line 7 and Figure 1 of Lohr.

Accordingly, the addition of a filter 22 as described by Kirchoff within the generator 2 of Lohr, would inhibit water vapor 50 production by reducing the temperature of the gases flowing into chamber 40. Accordingly, less water vapor would be produced for cooling of gases flowing through conduit 26 and for inflation of an airbag associated therewith.

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It will also be appreciated that longitudinal traverse of the gases flowing through conduit 26 also contributes to water vapor production 50 within chamber 40. As the gases 36 are throttled at a narrowing portion in conduit 26 that is radially inward of chamber 40, the water stored within material 41 is liberated due to a pressure drop created at the venturi defined by the narrowing portion of conduit 26. The water vapor 50 is then combined with gases 36 flowing through conduit 26. Accordingly, any filtration of these gases flowing through conduit 26 would affect the pressure balance established through conduit 26 and also through the narrowing portion. The humidification of the gases 36 within conduit 26 would arguably be adversely affected *by a change in the pressure differential* that might be caused by filtering the gases prior to humidification in the narrowing portion of conduit 26.

Accordingly, from a design perspective, one of ordinary skill in the art would likely not include a filter 22 of Kirchoff within the generator 2 of Lohr, for it would contravene the purposes of the design of the generator 2. Stated another way, Lohr teaches away from the inclusion of the filter 22 because of the method of humidification described. A reference cannot suggest an invention and at the same time teach away from the invention. The examiner is advised that a prima facie case of obviousness cannot be supported when a reference teaches away from the present invention. Furthermore, for the reasons stated above, the design of the inflator of Lohr certainly would not result in the requisite suggestion or motivation to either directly or implicitly motivate one of ordinary skill in the art to include the filter 22 of Kirchoff in the generator 2 of Lohr.

For the reasons set forth above, there is no suggestion or motivation, either in the references or in the knowledge generally available to one of ordinary skill in the art, to combine the teachings of Lohr '115 and Kirchoff et al. '545 to provide method steps of "humidifying the filtered combustion products to form humidified filtered combustion products" and "routing the humidified filtered combustion products into the airbag", as recited in claim 1.

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The examiner asserts that the test for combining references is what the combination of disclosures taken as a whole would suggest to one of ordinary skill in the art, *In re McLaughlin*. Further, the examiner indicates that references are properly evaluated by what they suggest to one of ordinary skill in the art, not by their specific disclosures, *In Re Bozek*. Applicants respectfully disagree with the examiner's conclusion and would direct the examiner to more controlling cases.

First, "The level of skill in the art cannot be relied upon to provide the suggestion to combine references." *Al-Site Corp. v. VSI Int'l Inc.*, 174 F.3d 1308, 50 USPQ2d 1161 (Fed. Cir. 1999).

Next, "The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, *and not based on applicant's disclosure*". *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991). It would appear that the examiner, with the benefit of the present application, exercised impermissible hindsight reconstruction, particularly in view of the art cited. For the particular sequence of filtering and then humidifying the combustion gases is not disclosed in the art. Nor is there any suggestion in the references to modify the inflators of any of the respective designs to accommodate the problem of the present invention; that is to provide lubricity to the airbag without agglomerating the moisture within combustion solids within the filter. None of the references cited by the examiner enable the present sequence or approach, nor do they recognize the present problem. As such, they cannot when taken alone or in combination with each other of present or suggest a solution to the same when viewed by one of ordinary skill in the art. In essence, one of ordinary skill in the art would not consult these references for they focus on problems and solutions not particular to the present invention or problem.

Further, "A statement that modifications of the prior art to meet the claimed invention would have been "well within the ordinary skill of the art at the time the claimed invention was made" because the references relied upon teach that all aspects of the claimed invention were individually known in the art

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is not sufficient to establish a prima facie case of obviousness without some objective reason to combine the teachings of the references." Ex parte Levensgood, 28 USPQ2d 1300 (Bd. Pat. App. & Inter. 1993). The examiner has not provided an objective reason to combine the references.

In sum, none of the references when taken alone or when taken together suggest or describe the present invention. Stated another way, for the reasons given, a prima facie case of obviousness cannot be supported by references that teach away from the present invention, nor can it be supported without the requisite showing of a motivation to combine the references.

The examiner is advised that if the proposed modification or combination of the prior art would change the principle of operation of the prior art invention being modified, then the teachings of the references are not sufficient to render the claims prima facie obvious. *In re Ratti*, 270 F.2d 810, 123 USPQ 349 (CCPA 1959). Filtering the effluent of Lohr prior to humidification would reduce the temperature of the gases, i.e. change the principle of operation, thereby inhibiting the ability of the gases to draw the moisture from the chamber 40 as they pass therethrough, and thereby inhibit the cooling of the gases.

The examiner is further advised that it is improper to combine references where the references teach away from their combination. *In re Grasselli*, 713 F.2d 731, 743, 218 USPQ 769, 779 (Fed. Cir. 1983).

(9) Conclusion:

For the above-stated reasons, the examiner has simply not met the burden of substantiating a prima facie case of obviousness relative to claims 1 and 4-6. Most importantly, the design of the inflator of Lohr teaches away from adding a filter that would function as a heat sink prior of the gases prior to the addition of the moisture. Accordingly, neither Lohr nor Kirchoff, either taken alone or together suggest a combination of the features of the respective inventions for the reasons stated. The requisite suggestion or motivation to

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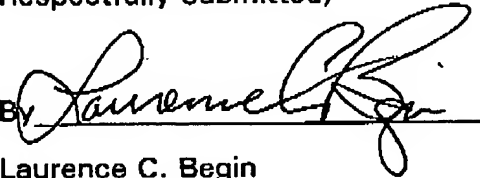
combine the references is therefore lacking. Accordingly, reversal of the Examiner's rejection of claims 1 and 4-6 under 35 U.S.C. §103, and issuance of the present application is courteously solicited.

Applicants have calculated a fee of \$500.00 for the appeal brief and \$1020.00 for a three-month extension of time in connection with this brief. Our credit card authorization sheet is enclosed authorizing the amount of \$1,520.00. The Commissioner is hereby authorized to charge any additional fees incident to the filing of this communication to Deposit Account No. 50-3238. A duplicate copy of the front page of this document is enclosed. Applicants have faxed three copies of this appeal brief pursuant to 37 C.F.R. 1.192.

Respectfully submitted,

Date 1/9/06

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(10) Appendix – Claims 1 and 4-6:

1. (original and pending) A method of improving inflation of an airbag comprising the steps of:

igniting a gas generant composition within a gas generator to form combustion products;

at least substantially filtering the combustion products to form filtered combustion products;

humidifying the filtered combustion products to form humidified filtered combustion products; and

routing the humidified filtered combustion products into the airbag.

2. (cancelled) The method of claim 1 wherein said humidifying step comprises passing the filtered combustion products over a bed of hydrated gelatin to form humidified filtered combustion products.

3. (cancelled) The method of claim 1 wherein said humidifying step comprises routing the filtered combustion products into an airbag coated with gelatin to form humidified filtered combustion products.

4. (pending and previously presented) The method of claim 1 wherein said humidifying step further comprises combining the filtered combustion

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products with about 1.0 moles of water for each mole of gas generant combusted.

5. (pending and previously presented) The method of claim 1 wherein said humidifying step further comprises combining the filtered combustion products with about 1.0 moles of water for each mole of gas generant combusted.

6. (pending and previously presented) A method of reducing an amount of fluid pressure required to release and inflate an airbag comprising the steps of:

- adding an amount of water to filtered combustion products
- resulting from combustion of a gas generant composition,
- thereby forming humidified filtered combustion products; and
- routing the humidified combustion products into an opening leading into the airbag, thereby reducing the resistance of the airbag to inflation and correspondingly reducing the amount of pressure required to inflate the airbag.

IN THE UNITED STATES PATENT
AND TRADEMARK OFFICE

Group Art Unit 3616
Examiner David R. Dunn

TAKASI FURUSAWA, et al.

APPEAL BRIEF

Serial No. 10/762,709

Filed January 22, 2004

For: AIRBAG RELEASE AID/

January 9, 2006

Box AF
Assistant Commissioner of Patents
Washington, D.C. 20231

Sir:

This is an appeal from the final rejection of claims 1 and 4-6 set forth in the office action mailed April 7, 2005. Concurrently herewith, Applicants petition for a three-month extension of time for the period of response and include the appropriate fee.

(1) Real Party of Interest:

The real party of interest in this appeal is Automotive Systems Laboratory, Inc., a Michigan corporation, the owner of the subject application by assignment.

(2) Related Appeals and Interferences:

There are presently no other appeals and/or interferences known to appellant, appellant's legal representative, or assignee which will directly affect or be directly affected by the Board's decision in the pending appeal.

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(3) Status of Claims:

Claims 1 and 4-6 are pending and stand finally rejected in an Office Action dated April 7, 2006 (Paper #20050331).

(4) Status of Amendments:

No Amendment was filed After the Final Rejection.

(5) Summary of the Invention:

In accordance with the present invention, a gas generator or airbag inflator contains a plurality of beads containing gel and water disposed around a propellant chamber of a conventional gas inflator. The plurality of beads operates, in conjunction with a primary expanded metal filter, as a secondary filter and heat sink, and, as an airbag release agent. By cooling the propellant combustion gases in stages and providing sufficient residence time within the generator, the CO and NO equilibrium conditions are shifted to relatively low, acceptable, CO and NO concentrations. At the same time, humidification or introduction of water vapor (released from the gelatin/water matrix) to substantially filtered combustion products reduces the pressure required to release and inflate an airbag in fluid communication with the inflator.

As claimed in claim 1, the present invention includes a method of improving inflation of an airbag by first substantially filtering combustion gases (to remove the solids) and thereby form filtered combustion products. Next, the filtered combustion products are humidified and then routed into an airbag. Humidification after the filtration step ensures that the filter is not blocked by dampened slag or solids thereby interrupting the gas flow into the bag. Furthermore, staged cooling of the gases prior to humidification optimizes the oxidation of gases not desired in the effluent.

Stated another way, and as claimed in claim 6, the present invention includes adding water to filtered combustion products and routing the filtered and then humidified combustion products into an airbag to improve the inflation of the airbag with a reduced amount of pressure.

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(6) Issues:

Did the Examiner err in finally rejecting claims 1 and 4-6 as being unpatentable over Lohr (U.S. Patent No. 3,711,115) in view of Kirchoff et al. (U.S. Patent No. 3,972,545) under 35 U.S.C. §103(a)?

(7) Grouping of Claims:

Claims 1 and 4-6 stand together as being rejected for the same reasons.

(8) Argument:

The basic reference applied against claims 1 and 4-6, namely U.S. Patent No. 3,711,115 to Lohr does not respond to the positive limitations of claims 1 and 6, and all claims dependent thereon. Lohr does describe an inflator for vehicle gas bags, but filtration is not considered. In fact the design of Lohr, as described below inherently teaches away from the filters of Kirchoff.

Applicant respectfully submits that the rejection of claims 1 and 4-6 under 35 U.S.C. 103(a) should be withdrawn because a prima facie case for the obviousness of claim 1 has not been established. Specifically, there is no suggestion or motivation, either in the references or in the knowledge generally available to one of ordinary skill in the art, to combine the teachings of Lohr '115 and Kirchoff et al. '545 to provide method steps of "humidifying the filtered combustion products to form humidified filtered combustion products" and "routing the humidified filtered combustion products into the airbag", as recited in claim 1.

The cited references do not, either alone or in combination, show or suggest any relationship between the addition of water to the combustion products after combustion, and after the filtration of the combustion products. In the cited references, both the use of filters (in Kirchoff et al. '545) and the addition of water (in Lohr '115) are directed to cooling the gases prior to injection of the gases into an airbag. In Lohr '115, water is added to combustion gases for cooling the gases prior to injection of the gases into an airbag. No

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filtration of the gases is disclosed, either prior to or after addition of the water to the gases. Therefore, there is no teaching or suggestion in Lohr '115 regarding filtration of combustion products either before or after humidification of the combustion products. Kirchoff et al. '545 is silent as to the addition of water to the combustion products, either before or after filtration. Therefore, there is no teaching or suggestion in Kirchoff et al. '545 regarding filtration of combustion products either before or after humidification of the combustion products. Thus, neither of the cited references, alone or in combination, show nor suggest any relationship between the addition of water to the combustion products after combustion, and the filtration of the combustion products.

Also as stated above, Kirchoff et al. '545 is silent as to the addition of water to combustion products either before or after filtration. However, Lohr '115 teaches the addition of water to combustions gases without prior filtration of the gases. Lohr '115 also teaches the routing of unfiltered combustion products into the airbag. Therefore, Lohr '115 teaches against filtration of combustion products prior to the addition of water, and against the routing of humidified filtered combustion products into the airbag, as disclosed in the present application.

It should further be noted that the gas generator of Kirchoff employs a filter 22 prior to treatment of the gases neutralizing material 26. However, the same material is also used to cool the gases thereafter. Note that in column 3, lines 9-34, Kirchoff indicates that the same material of filter 22 is used after treatment of the gases as the gases pass through section 30 for cooling. Kirchoff does not suggest an alternative to cooling the gases, as they are essentially further filtered/cooled after treatment within the pH neutralizing material, in contravention of the present invention. Without any suggestion of the generic nature of treatment by Lohr or Kirchoff, the examiner also equates the treatment of the gases by pH in Kirchoff with the humidification of the gases in the present invention. There is simply no substantive evidence in the references to support this assertion by the examiner.

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Finally, from a pragmatic standpoint, the filter of Kirchoff simply would not be added to the inflator of Lohr, for the engineering considerations of Lohr would prohibit this. Kirchoff describes a filter 22 that provides filtration of gas *flowing longitudinally* from the combustion chamber (s). The filter 22 of Kirchoff simply would not be employed within the inflator of Lohr given that combustion gases (for inflation of an airbag) produced therein initially *flow radially inward* into passage 26, not in an initial longitudinal path as provided in Kirchoff. The combustion gases of Lohr then flow longitudinally through passage 26 as described at column 9, lines 43-58 for example. Accordingly, the filter 22 of Kirchoff would provide very little filtration of the combustion gases (perhaps filtration of gases ultimately flowing into chamber 40), that are used to inflate the airbag. If the filter 22 of Kirchoff was employed, it will be appreciated that "hot gases" would be filtered, but they would also be relatively cooled as they pass through the filter. This contravenes the theory of operation provided by Lohr.

In addition to the desorbing and dehydrating effect of reduced pressures, a limited number of holes 42 disposed in the fireproof wall 44, separating the second combustion state 28, or downstream stage in the case of a gas generator having more than two stages, and the water removal means 38, provide the means for a small percentage of the gas generated in compartment 21 to flow into the water removal means compartment 40. This gas flow is indicated by the arrows 37. The gas 37 heats the particles 41. Of course, the gas flowing through the nozzle 46 also indirectly heat the particles 41. The effect of temperature increase on desorption and dehydration is the same as that of reduced pressure. Thus, the combined effect of increased temperature and decreased pressure is the liberation of most of the water held by the water removal means 38. See Column 9, line 59 through Column 10, line 7 and Figure 1 of Lohr.

Accordingly, the addition of a filter 22 as described by Kirchoff within the generator 2 of Lohr, would inhibit water vapor 50 production by reducing the temperature of the gases flowing into chamber 40. Accordingly, less water vapor would be produced for cooling of gases flowing through conduit 26 and for inflation of an airbag associated therewith.

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It will also be appreciated that longitudinal traverse of the gases flowing through conduit 26 also contributes to water vapor production 50 within chamber 40. As the gases 36 are throttled at a narrowing portion in conduit 26 that is radially inward of chamber 40, the water stored within material 41 is liberated due to a pressure drop created at the venturi defined by the narrowing portion of conduit 26. The water vapor 50 is then combined with gases 36 flowing through conduit 26. Accordingly, any filtration of these gases flowing through conduit 26 would affect the pressure balance established through conduit 26 and also through the narrowing portion. The humidification of the gases 36 within conduit 26 would arguably be adversely affected *by a change in the pressure differential* that might be caused by filtering the gases prior to humidification in the narrowing portion of conduit 26.

Accordingly, from a design perspective, one of ordinary skill in the art would likely not include a filter 22 of Kirchoff within the generator 2 of Lohr, for it would contravene the purposes of the design of the generator 2. Stated another way, Lohr teaches away from the inclusion of the filter 22 because of the method of humidification described. A reference cannot suggest an invention and at the same time teach away from the invention. The examiner is advised that a prima facie case of obviousness cannot be supported when a reference teaches away from the present invention. Furthermore, for the reasons stated above, the design of the inflator of Lohr certainly would not result in the requisite suggestion or motivation to either directly or implicitly motivate one of ordinary skill in the art to include the filter 22 of Kirchoff in the generator 2 of Lohr.

For the reasons set forth above, there is no suggestion or motivation, either in the references or in the knowledge generally available to one of ordinary skill in the art, to combine the teachings of Lohr '115 and Kirchoff et al. '545 to provide method steps of "humidifying the filtered combustion products to form humidified filtered combustion products" and "routing the humidified filtered combustion products into the airbag", as recited in claim 1.

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The examiner asserts that the test for combining references is what the combination of disclosures taken as a whole would suggest to one of ordinary skill in the art, *In re McLaughlin*. Further, the examiner indicates that references are properly evaluated by what they suggest to one of ordinary skill in the art, not by their specific disclosures, *In Re Bozek*. Applicants respectfully disagree with the examiner's conclusion and would direct the examiner to more controlling cases.

First, "The level of skill in the art cannot be relied upon to provide the suggestion to combine references." *Al-Site Corp. v. VSI Int'l Inc.*, 174 F.3d 1308, 50 USPQ2d 1161 (Fed. Circ. 1999).

Next, "The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, *and not based on applicant's disclosure*". *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991). It would appear that the examiner, with the benefit of the present application, exercised impermissible hindsight reconstruction, particularly in view of the art cited. For the particular sequence of filtering and then humidifying the combustion gases is not disclosed in the art. Nor is there any suggestion in the references to modify the inflators of any of the respective designs to accommodate the problem of the present invention; that is to provide lubricity to the airbag without agglomerating the moisture within combustion solids within the filter. None of the references cited by the examiner enable the present sequence or approach, nor do they recognize the present problem. As such, they cannot when taken alone or in combination with each other of present or suggest a solution to the same when viewed by one of ordinary skill in the art. In essence, one of ordinary skill in the art would not consult these references for they focus on problems and solutions not particular to the present invention or problem.

Further, "A statement that modifications of the prior art to meet the claimed invention would have been "well within the ordinary skill of the art at the time the claimed invention was made" because the references relied upon teach that all aspects of the claimed invention were individually known in the art

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is not sufficient to establish a prima facie case of obviousness without some objective reason to combine the teachings of the references." *Ex parte Levensgood*, 28 USPQ2d 1300 (Bd. Pat. App. & Inter. 1993). The examiner has not provided an objective reason to combine the references.

In sum, none of the references when taken alone or when taken together suggest or describe the present invention. Stated another way, for the reasons given, a prima facie case of obviousness cannot be supported by references that teach away from the present invention, nor can it be supported without the requisite showing of a motivation to combine the references.

The examiner is advised that if the proposed modification or combination of the prior art would change the principle of operation of the prior art invention being modified, then the teachings of the references are not sufficient to render the claims prima facie obvious. *In re Ratti*, 270 F.2d 810, 123 USPQ 349 (CCPA 1959). Filtering the effluent of Lohr prior to humidification would reduce the temperature of the gases, i.e. change the principle of operation, thereby inhibiting the ability of the gases to draw the moisture from the chamber 40 as they pass therethrough, and thereby inhibit the cooling of the gases.

The examiner is further advised that it is improper to combine references where the references teach away from their combination. *In re Grasselli*, 713 F.2d 731, 743, 218 USPQ 769, 779 (Fed. Cir. 1983).

(9) Conclusion:

For the above-stated reasons, the examiner has simply not met the burden of substantiating a prima facie case of obviousness relative to claims 1 and 4-6. Most importantly, the design of the inflator of Lohr teaches away from adding a filter that would function as a heat sink prior of the gases prior to the addition of the moisture. Accordingly, neither Lohr nor Kirchoff, either taken alone or together suggest a combination of the features of the respective inventions for the reasons stated. The requisite suggestion or motivation to

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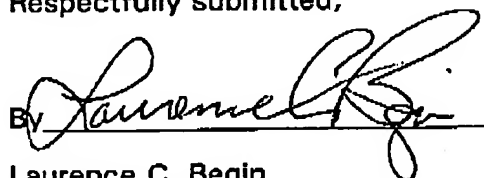
Date

1/9/06

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(10) Appendix – Claims 1 and 4-6:

1. (original and pending) A method of improving inflation of an airbag comprising the steps of:

igniting a gas generant composition within a gas generator to form combustion products;

at least substantially filtering the combustion products to form filtered combustion products;

humidifying the filtered combustion products to form humidified filtered combustion products; and

routing the humidified filtered combustion products into the airbag.

2. (cancelled) The method of claim 1 wherein said humidifying step comprises passing the filtered combustion products over a bed of hydrated gelatin to form humidified filtered combustion products.

3. (cancelled) The method of claim 1 wherein said humidifying step comprises routing the filtered combustion products into an airbag coated with gelatin to form humidified filtered combustion products.

4. (pending and previously presented) The method of claim 1 wherein said humidifying step further comprises combining the filtered combustion

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products with about 1.0 moles of water for each mole of gas generant combusted.

5. (pending and previously presented) The method of claim 1 wherein said humidifying step further comprises combining the filtered combustion products with about 1.0 moles of water for each mole of gas generant combusted.

6. (pending and previously presented) A method of reducing an amount of fluid pressure required to release and inflate an airbag comprising the steps of:
adding an amount of water to filtered combustion products
resulting from combustion of a gas generant composition,
thereby forming humidified filtered combustion products; and
routing the humidified combustion products into an opening
leading into the airbag, thereby reducing the resistance of the
airbag to inflation and correspondingly reducing the amount of
pressure required to inflate the airbag.

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